First Thoughts on Interactions with the Time Conditions Database

- Strategy and Goals
- Starting Assumptions
- Reminder: Silicon Tracker Description Design (D. Calvet)
- Athena Infrastructure Issues
- Action Plan

M. Shapiro, U.C. Berkeley/LBNL

Strategy and Goals

Goal: To develop general mechanism for retrieving time-dependent alignment constants from database and using them in reconstruction

$\longrightarrow$ Requires additions to Athena infrastructure

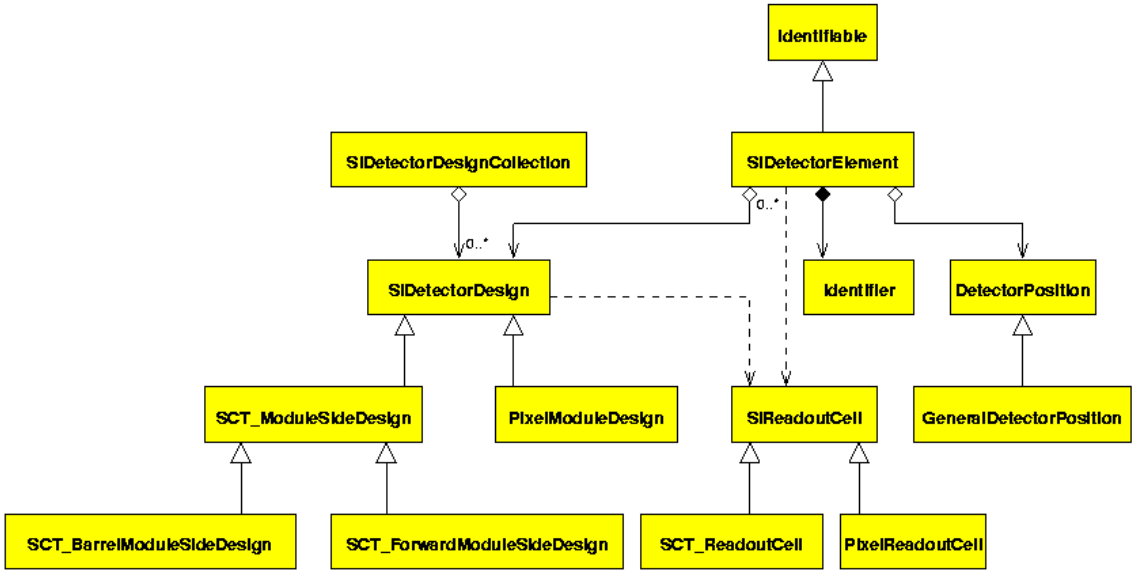
$\longrightarrow$ Requires extension of existing detector description interface

Will prototype using silicon and pixel detectors as the use case

Starting Assumptions

- Primary description of reco and sim geometry derived from XML using AGDD tools and Indet classes
- XML description contains information necessary to build ideal (perfectly aligned) detector.
- Misalignments applied by specifying deviations from the ideal.
  - These deviations in general time dependent
- Misalignments calculated from numbers stored ”Conditions Database”
  - Delivered through a general ”Time Dependent Conditions Service” in Athena (TCS)
  - API for TCS not yet determined. Requirements of reco geometry an important input to design of the service.
  - Persistent database design is the responsibility of the database group.

Silicon Tracker Description
(David Calvet)



- Collection of DetectorElements will be accessed through TDeS
  - Since TDeS not yet implemented, for now accessed via TES
- DetectorElement contains description of module of pixels or one side of a module of SCT
  - Logical Identifier
  - Reference to SiDetectorDesign (local geometry)
  - Reference to DetectorPosition (global position and orientation)
- Natural to extend DetectorElement to interface to alignment data in DB

What Would Extension of DetectorElement look like?

- Keep existing reference to ideal DetectorPosition
- Calculate true DetectorPosition as product of DetectorPosition and delta from DB
- We want to *cache* this product for speed-performance
- Need to work out notification mechanism for when DB constants change:
  - Assumption is that a whole collection is read from DB at once
  - Read occurs on first use after change of validity interval
  - Does reread force recalculation or just mark old result invalid???

Athena Infrastructure Issues

- In addition to event store (TES):
  - Need a detector store (TDeS)
  - Need interface to conditions DB (TCS)
- A prototype TDeS coded by C. Leggett and P. Calafiura (a second instance of the Store-Gate Service without object deletion at the end of each event)
  - Modified David Calvet's SiDetectorDescriptor to insert in this store rather than TES
  - David C currently reviewing the prototype
- Group formed to work on design and implementation of interface to conditions DB in Athena: regular phone meeting established.

  Christian Arnault, Stan Bentvelsen Paolo Calafiura, Luc Goossens, Charles Leggett, David Malon, Srini Rajagopalan, David Rousseau, RD Schaffer, Marge Shapiro, David Quarrie
- Group will use silicon alignment as prototype project for development of the infrastructure
- Charles and Luc will work on design of TCS
- Luc will be our representative to database group

Action Plan

- Modify David's classes to include interface alignment constants (M. Shapiro, with advice from David)
- Create a conditions database that holds fake alignment constants for two separate validity ranges:
  - Specification of what should be stored in the DB should be done by the inner detector alignment group
  - M. Shapiro will code transient class
  - L. Goossens will code converter and will create the database
- Develop mechanism to update constants at boundary between validity ranges (discussion in Conditions DB phone meetings)

Questions for This Group

- What do we want to store in the DB? (perhaps a collection of HepTransforms???)
- Do we want a single collection per system or a finer granularity?
- What key for validity range (Unix Time, run and event number, etc)? How often do consts change?
- Are there other classes that need to be notified when the constants are updated?